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# Invertebrate Conservation News



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# INVERTEBRATE CONSERVATION NEWS



No. 62, June 2010

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## EDITORIAL

At the time of writing (late April), the financial indebtedness of various countries has been very prominent in the news. There are warnings of disaster for countries whose governments fail to take convincing steps towards balancing their budgets. In order to do so, they will probably slash their spending most severely in areas that they think will cost them the fewest votes of electoral discontent. Unlike health care, social welfare and education, wildlife conservation could be perceived as such an area.

Here in the UK, there is concern that the government will sell publicly owned land with renewed vigour, thus providing opportunities for environmentally harmful redevelopment. Institutions such as railways and hospitals have often managed their land with relatively little regard for wildlife, but they have in many instances allowed habitats to exist informally. Habitats have therefore been widely obliterated as a result of the sale and redevelopment of such land, which started mainly in the 1980s.

Despite continuing sales, large areas of publicly owned land still remain in the UK. A possible target for reinvigorated sales is the estate of the Forestry Commission (FC). The sale of parcels of FC land in the 1980s provoked mixed reactions. There were concerns about purchasers' intentions with regard to conservation, landscape management and public access but there was also a view that the FC's early practices had often done more harm than good from a conservation standpoint. The development of a more conservation-friendly policy in the FC has, however progressed to the point where many naturalists and others are becoming increasingly concerned about the prospect of a revival of a government-inspired policy of woodland sales.





There is concern also that land owned by the Ministry of Defence (MoD) could be increasingly put up for sale. As can be seen in any edition of the MoD's excellent wildlife magazine *Sanctuary*, military occupation has protected habitats which have largely been obliterated elsewhere by intensive farming and urban development. The sale of MoD land is authorised only if the sites concerned are deemed to be no longer of use for the defence of the realm but this could happen increasingly if future cuts in the UK's defence budget have the effect of reducing the requirement for the military land holding. The reverse could, however, be the case, depending on defence policy.

Although governments have often been incidental custodians of biodiversity by virtue of holding land and thus making it unavailable for commercial development, they have elsewhere destroyed wildlife habitats by promoting grandiose projects. For example, developments for the 2012 London Olympics have attracted criticism in this context, as mentioned in recent issues of *ICN*. With governments in various countries set to reduce their expenditure, perhaps there will at least be a stay of execution for the wildlife that exists on sites previously earmarked for prestige projects.

Subsidies for agriculture have long been another major form of government spending in many countries, with ecologically and economically controversial consequences. As mentioned in recent issues of *ICN*, subsidies in Europe have to some extent shifted towards agri-environment schemes, in recognition of the harmful effects of agricultural intensification during previous decades. It seems too early to predict future policies on the overall size of subsidies, let alone the balance between food production and conservation. If, however, intensification of agriculture receives less support in future, there could be some benefit for habitats that would otherwise have been destroyed or degraded. On the other hand, an increased need for home-produced food could make agri-environment schemes look too much of a luxury. Also, the need to replace fossil fuels with 'renewables' is likely to encourage intensified forms of woodland management for wood fuel, perhaps to the point where deadwood habitats become increasingly confined to protected sites.

The need of various countries to solve their current severe economic problems is perhaps diverting attention from fundamental problems such as climate change and the growth of human populations. For densely populated countries like the UK, an increasing need for food, housing and infrastructure is likely to have serious consequences with regard to the destruction, degradation and fragmentation of wildlife



habitats. In some of those countries, population has increased rapidly owing to an influx of migrants but it remains to be seen whether such patterns will continue.

It would of course be wrong to assume that there is a straightforward negative relationship between the density of human populations and the survival of wildlife. Much depends on the manner in which land is used and in which people go about their lives. There is certainly scope for improvement. For example, it could be more than wishful thinking to suppose that a combination of austerity and green transport policies might at least slow down the increase in car usage. If so, there would be less pressure for the building and widening of roads, with the associated destruction and fragmentation of habitats. There might also be less of an increase in the 'road kill' of invertebrates.

Perhaps austerity will also diminish the craze for the paving of domestic gardens (no pun originally intended!) and the consequent loss of green space and of habitat. On the other hand, people might spend more on such domestic 'improvements' if they find themselves staying more at home owing to the cost of travel. If, however, they cease even to afford the price of large quantities of bird food, garden invertebrates might suffer a lower degree of predation than is currently imposed by artificially boosted bird populations. On the other hand, there would be a loss of income for conservation organisations which currently benefit from the sale of bird food.

Although governments have often supported environmentally damaging schemes, they generally employ people to promote wildlife conservation. Cuts in this area of expenditure could therefore have serious consequences. In the UK, the impact of any such cuts would be superimposed on adverse shifts in staffing policy that began before the advent of the economic crisis. As a result, there is already a serious lack of specialist staff holding key positions within the UK's statutory conservation agencies. This is currently a major concern of Invertebrate Link, the national umbrella group for invertebrate conservation.

The decline in the key specialist staffing of the UK agencies is adversely affecting not only their work in promoting conservation but also their provision of advice to legislators. Wildlife legislation in the UK is far from ideal but it has been influenced by the principle that measures to control the collection of invertebrate species should apply only to the relative few that are demonstrably at risk from this activity. If official advisers with specialist knowledge of invertebrates were to disappear from the scene, UK legislation could become increasingly influenced by others who, through apparent ignorance of invertebrate



population dynamics and a disregard of the importance of collecting for the purpose of study, would like to emulate certain other countries by imposing blanket bans. It is, however, heartening to see signs of a groundswell of recognition of the need for people, especially children, not to be inappropriately discouraged from gaining an intimate contact with nature.

In many countries, government funding is important not only in the direct promotion of conservation but also in the support of activities that underpin conservation, including education, research and the work of national and regional museums. Any reduction in funding of such activities would have serious consequences, not least because the specialists of the future will require resources for their education and employment. State-funded resources are important also for amateurs, who make a major contribution to conservation in the UK and in other countries. It is therefore to be hoped that the voluntary organisations to which they belong will fare well in the economically hard times ahead.



## NEWS, VIEWS AND GENERAL INFORMATION

### Review of legal protection for invertebrates in the UK

As mentioned in *ICN* 57, the fifth quinquennial review of Schedule 5 of the Wildlife and Countryside Act 1981 began in March 2008. The review, which applies to England and Wales but not directly to Scotland, reached its final consultative stage early in 2010. The consultation document included several proposed changes to the species-listing. These were based principally on the recommendations of the Joint Nature Conservation Committee (JNCC). A response to the consultation has been submitted by Invertebrate Link (the UK's umbrella body of national organisations involved in invertebrate conservation), following the recommendations of a small sub-group hosted by Buglife – The Invertebrate Conservation Trust.

The following list summarises the official proposals and the corresponding responses of Invertebrate Link. The relevant sections of Schedule 5 are shown in square brackets.

- Talisker (or Narrow-bordered) burnet moth *Zygaena lonicerae* ssp. *jocelynae* and the Slender Scotch burnet moth *Zygaena loti* ssp.





*scotica*. For these taxa, whose UK populations are confined to Scotland, the JNCC recommends listing for protection in respect of sale and related activities only [S. 9(5)]. This accords with the long-standing position of InvLink but the English and Welsh government proposal is for full protection [S. 9(1 to 5)] if the Scottish government decides the same.

- Essex Emerald moth *Thetidia smaragdaria*. Since this species is deemed to have become extinct in the UK, there is general agreement that its protection should be removed.
- Lagoon sand shrimp *Gammarus insensibilis*. There is general agreement that protection of this species should be reduced so as to cover destruction of its places of shelter [S. 9(a)] only.
- European spiny lobster *Palinurus elephas*. The JNCC's recommendation, with strong InvLink support, is for protection in respect of taking [S. 9(1)], killing or injuring [S. 9(1)], possession [S. 9(2)], disturbance [S. 9(4)(b)] and sale [S. 9(5)]. The government, with fisheries interests in mind, proposes not to list this species.
- Lagoon snail *Paludinella littorina*. There is general agreement that protection of this species should be removed.
- Tentacled lagoon-worm *Alkmaria romijni*. The JNCC's recommendation, supported by InvLink, is that the listing of this annelid worm should be amended to cover destruction of its places of shelter [S. 9(4)(a)] only. The governmental view, based on an apparent error in communications with JNCC, is that protection from disturbance [S. 9(b)] should also continue to apply, so that anyone wishing to collect a few specimens for study would still be compelled to seek a licence.

### **Proposal for flower-rich corridors in Great Britain**

Buglife – The Invertebrate Trust is calling on the UK government to create a network of wildflower meadows in Britain, so as to help redress an estimated loss of three million hectares of flower-rich habitats since the Second World War. There are increasing signs that this loss has been having a severe impact on populations of bees, butterflies, moths, hoverflies and other pollinators. Some of these species have become endangered and there is general cause for concern about the potential loss of their 'services' as pollinators of many of our crops.



Buglife states that past governments have made little effort to address the problem and that agri-environment schemes have re-created only 6,500 ha of such habitats so far. The proposal from Buglife is that a system of 300-metre-wide "B-lines", consisting of belts of flower-rich habitat, should be established across Britain; one going east-west and the other north-south. They would be carefully planned to avoid woods, lakes and other unsuitable areas.

Buglife envisages an annual cost between £30 and £40 million but proposes that funds would be raised by a requirement for credits to be purchased by developers and others who provide economic benefits but who also degrade wildlife habitats in the process. Buglife believes that the scheme would improve economic security by safeguarding 'pollination services' worth £440 million p.a. The other benefits would include the creation or securing of 150,700 ha of permanent flower rich grassland, a reduction in methane emissions by virtue of an improved diet for livestock, sequestration of CO<sub>2</sub> in new grassland soils, the conservation of endangered grassland biodiversity, the creation of green jobs and the improvement of connections between people and wildlife.

### **UK government planning policy in relation to habitats**

At the time of writing, there is a consultation on a proposed revision of the UK government's "Planning Policy Statement 9" (PPS9) on biodiversity and geological conservation, which guides planning authorities in their decisions whether to give planning consent for developments. In principle, PPS9 should steer these authorities towards taking proper account of invertebrates and their habitats but the safeguards have often proved weak in practice.

The government proposal is to replace PPS9 with a new statement (*"Planning for a Natural and Healthy Environment"*), which would be extended to include open spaces, sport and recreation, sustainable development in rural areas, landscape protection and coastal access.

A firm of consultants, Bakers, has commented that the biodiversity aspects of the newly proposed PPS are greatly reduced in comparison with those of the existing PPS9. They point out, however that the consultation includes revised versions of two government circulars which deal with biological and geological conservation. These are ODPM Circular 06/2005 and Defra Circular 01/2005 Circular: "Biodiversity and Geological Conservation - Statutory obligations and their impact within the planning system".





Consultation will have closed before this issue of *ICN* is published, but the AES Conservation Committee will consider whether to respond in the meantime.

### Reference

[http://www.bakerconsultants.co.uk/blog/2010/3/proposed\\_overhaul\\_of\\_pps9](http://www.bakerconsultants.co.uk/blog/2010/3/proposed_overhaul_of_pps9)

### Deep sea smokers

Amazing assemblages of invertebrates are associated with hydrothermal vents in the ocean floor. These are sites where plumes of mineral-rich water are discharged at temperatures as high as 300°C but are prevented from boiling by the pressure of the deep ocean. The vents occur along tectonic plate boundaries, where seawater flows through fissures and porous rocks in the ocean floor and becomes heated by underlying magma. In some cases, water can also be released from the magma itself.

Recently, a British team, led by the National Oceanography Centre (NOC) in Southampton, has discovered the deepest vents so far known at a depth of 5,000 m (3.1 miles) in the Cayman Trough of the Caribbean. The team saw spectacular views of ‘black smokers’, chimney-like structures, which grow by incremental precipitation and deposition of sulphide-rich minerals as the water emerges. Elsewhere, such chimneys have been reported to reach as much as 60 m in height. There are also ‘white smokers’ in some areas; these are rich in light-coloured minerals, containing elements such as barium, calcium or silicon.

Hydrothermal vent zones have an estimated density of organisms 10,000 to 100,000 times greater than in the deep oceans generally, where species depend on a light ‘rain’ of detritus descending from the photosynthetically fuelled communities in the surface waters. Some of the vent organisms, together with the mineral deposits, are spectacularly coloured when seen in the artificial light of underwater equipment. A member of the NOC team described “rainbow hues of the mineral spires and the fluorescent blues of the microbial mats”, the like of which he had never seen before.

The microbial mats include the primary producers of the food chain associated with the vents. These are members of the Kingdom Archaea which, in the absence of sunlight, derive energy from chemosynthesis, utilising substances such as hydrogen sulphide. Numerous invertebrate species, including clams, limpets, amphipods and copepods, graze



upon the mats directly. These primary consumers are fed upon by larger organisms such as snails, shrimps, crabs, giant tube worms, octopuses and fish.

Among the 300-odd new species that have been discovered at hydrothermal vents, the tube worms, which include species such as *Ternia jerichonana* and *Riftia pachyptila*, are particularly fascinating, since they absorb soluble carbon-based nutrients directly into their tissues, having no mouths or digestive tracts. These nutrients are produced by immense concentrations of microbes, which live in the bodies of the worms and have a symbiotic relationship with them. The worms produce haemoglobin, which the microbes use in order to derive energy from hydrogen sulphide. Another remarkable worm of the vent system is the Pompeii worm *Alvinella pompejana*, which can withstand temperatures up to 80°C. Equally fascinating is *Crysomallon squamiferum*, a snail with a foot reinforced by scales made of iron and organic materials.

The NOC team hopes that studies of the vent communities will aid understanding of their ecology. In turn, this could aid efforts to protect endangered marine species but there are concerns that human activities could drive some of them to extinction, perhaps even before they can become known to science.

One of the main threats is the exploitation of the massive mineral deposits that occur around the vents. These contain metals such as gold, silver, copper and zinc. Exploitation of minerals at such great depth has been a challenge but it is becoming economically feasible owing to recent advances in deep-sea oil exploration. In 2005, a company called Neptune Resources NL was granted 35,000 km<sup>2</sup> of exploration rights over the Kermadec Arc in New Zealand's Exclusive Economic Zone. Also, the government of Papua New Guinea has issued the world's first deep-sea mining permit, covering the Solwarra deposit of the Bismarek Sea at a depth of 1,600 m. The permit holder is Nautilus Minerals, a small Canadian company backed by the giant mining company Anglo-American. In a pilot trial in 2006, the company raised 10 tonnes of material and expects to be in commercial production by 2012.

Conservation biologist Professor Rick Steiner, formerly of the University of Alaska, who was called in to examine the environmental impact assessment study originally commissioned by Nautilus, is said to be concerned that the operation will destroy all the vent chimneys in the mining area. He is concerned also about the dumping of thousands of tonnes of rock on the seabed and about the danger of spillages of



toxic residue. Another possible problem is the disturbance of sediments, which could affect filter feeding organisms. More spectacularly, others have suggested that mining activities could trigger methane clathrate release, or even sub-oceanic landslides.

Prof. Steiner predicts that there could be a 'gold rush' to exploit vent systems in all the oceans of the world. On the other hand, Steven Rogers, Chief Executive Officer of Nautilus, is quoted as saying that, despite the damage that would inevitably occur, the system could recover. It is true that 'chimney' formation is dynamic, with the eventual collapse of chimneys that have grown unstable (increasing in height by as much as 30 cm per day), presumably to be succeeded by new ones. Mr Rogers is also quoted as arguing that deep-sea mining will be less damaging to the environment than mining on land.



## SITES AND SPECIES OF INTEREST

### Update on Salt Creek tiger beetle in Nebraska, USA

The Salt Creek tiger beetle *Cicindela nevadica lincolniana* is critically endangered, being now restricted to a few remnant salt marshes near Lincoln, Nebraska. It is considered an indicator species of an ecologically 'healthy' saline marsh, fed by groundwater from salt-rich rock deposited by an ancient sea. Most of the salt marshes where the beetle used to occur have been destroyed or severely degraded. The species is believed to be one of the world's rarest insects, with an estimated remaining population of fewer than 700 individuals.

As mentioned in *ICN* 43, a proposal for a major urban development has led to arguments about the area of land to be designated as critical habitat for this beetle. According to a press statement from the Xerces Society for Invertebrate Conservation, an official designation has recently been announced by U.S. Fish and Wildlife Service (USFWS). The designation covers 1,933 acres (783 ha), but Xerces points out that scientists believe this to be insufficient for recovery of the species. A much larger area of 36,000 acres (14,575 ha) was proposed in a strategy paper, prepared in 2005 by biologists at institutes including USFWS, as well as the University of Nebraska-Lincoln. Xerces points out that three independent peer-reviewers, with relevant expertise, reviewed and concurred with the strategy. The proposal was later





scaled down to 15,000 acres (6,073 ha), when the authors of the paper were asked to estimate the minimum area of habitat needed in order for the species to recover.

Despite the belief of biologists that populations of the beetle could rise to a more sustainable level in an adequately protected area of saltmarsh, local farmers have claimed that the species is beyond reasonable hope and have therefore argued that scarce public funds should not be spent on it.

### **Petition for protection of endangered American stonefly**

The Xerces Society, with others, has submitted a petition for the registration of the stonefly *Capnia arapahoe*, known as the Arapahoe snowfly, under the USA's Endangered Species Act. According to Xerces, this small winter stonefly is known only from two small tributaries of the Cache la Poudre River in Larimer County in north-central Colorado. As the English name of this species implies, the adults emerge in late winter or early spring, following a diapause during the warm months of the previous year.

Xerces has assessed the stonefly to be critically imperilled, owing to degradation and destruction of its habitat from extensive recreational use and increasing pressures from activities including the following: livestock grazing; timbering projects; stream de-watering; insecticide application close to water bodies; sedimentation and runoff from roads and trails; effluent from residential and destination resort septic systems. Xerces hopes that legal registration would help to support research in order to evaluate population size, distribution, and stability and to assess and strengthen current management practices for existing habitat.

### **Newly discovered invertebrates threatened in South Africa**

Biologists working for the environmental charity Earthwatch are reported to have discovered 18 species of invertebrates new to science, including spiders, snails, millipedes, earthworms and centipedes, at the Mkhambathi nature reserve on the Wild Coast in the Eastern Cape of South Africa. The discovery of these species took place in the course of only eight days, leading to a prediction that many others remain to be discovered and that the area is of exceptional value with regard to biodiversity.

Although the reserve has some degree of protection, there are concerns that the newly discovered species, still to be named, could be



under threat, together with others, owing to proposed developments for a toll road and titanium mining. Michelle Hamer, a scientist at the South African National Biodiversity Institute, is concerned generally about the considerable pressure to develop tourism infrastructure inside the reserve. As a result, many of the species now present could have disappeared before even being discovered.

### **Black-veined moth *Siona lineata* in Kent, SE England**

Sean Clancy and others working for Butterfly Conservation surveyed sites for this legally protected moth during 2009. The results indicated the presence of eight discrete populations, two of which lay within the Wye National Nature Reserve (NNR). One of the sites concerned was evidently re-colonised in 2009, following the disappearance of the species in 2002. At another site, where grazing is thought to be excessive, only three adults were seen; the smallest number in recent years. An increased intensity of grazing, following a change of grazier, is thought to have led to a decline in numbers also in certain compartments of the Wye NNR.

The objective for habitat management is to maintain a sward suitable for the moth by controlling scrub and by grazing at an intensity that is not excessive. For a species that warrants special attention by virtue of its rarity, there is arguably a case for some degree of micro-management (or 'habitat gardening') in order to provide a suitable sward. More generally, however, a wide range of invertebrates and other wildlife can be favoured by a more 'broad-brush' form of grassland management, often compatible with commercial land use, in which a rotational process provides a dynamic mosaic of sward heights, together with some areas of scrub.

### **Reference**

*Lepidoptera Conservation Bulletin* No. 10, April 2009 – March 2010, p. 5. Butterfly Conservation, UK

### **Basil Thyme case-bearing moth *Coleophora tricolor* in East Anglia**

According to a report from Butterfly Conservation (BC), this specialist moth of the East Anglian Breckland has fared badly owing to the weather of recent years, which has encouraged the development of coarser swards, thus reducing the extent of potential habitat. On the basis of evidence that disturbance favours the development of suitable



vegetation, scarification has been undertaken at some of the sites where the moth has been found. In a survey on behalf of BC during 2009, Gerry Haggett found colonies of the moth only in one metapopulation. All four localities concerned had been scarified in the previous spring.

### Reference

*Lepidoptera Conservation Bulletin* No. 10, April 2009 – March 2010, p. 4. Butterfly Conservation, UK



## RESEARCH NOTES

### Stinging nettle aids natural control of cereal pests

In northern Europe, aphids are among the most prevalent pests in cereal crops. It has been claimed that their prevalence has increased because of the use of pesticides that have reduced populations of their natural enemies. These include certain generalist predators such as the rove beetle *Tachyporus hypnorum*, which feed both on aphids and on plant-parasitic fungi such as mildews. Populations of such predators have reportedly declined because fungicides have deprived them of their fungal diet. Also the use of herbicides can destroy the habitats of various natural enemies of aphids. It is therefore interesting to see some recent research that supports the idea that certain weeds are beneficial for farmers as well as for wildlife.

A research group at the University of Gembloux, Belgium assessed the effect of the presence of Stinging nettle *Urtica dioica* on the diversity and abundance of aphids and their predators in fields of three arable crops: wheat, green pea and rape. In each field, two groups of 200 nettle plants were introduced into each of two plots of 10 x 20 m. The invertebrates were sampled at weekly intervals during the growing season in order to compare the nettle plots with the remainder of the crop fields.

Of the three crop species, the wheat showed the greatest range of aphid species, but the peas showed the highest count of individual aphids, mainly because of the abundance of the Green pea aphid *Acyrtosiphon pisum*, one of seven species present. Where nettles were present in the pea field, aphid abundance was, however, reduced by about 90%. The overall abundance of aphids was much lower in both the wheat and rape fields than in the pea field. Aphid abundance





was, however, higher in the plots where the nettles had been introduced into these crops, probably because the nettles provided a suitable habitat for aphids such as *Microlophium carnosum*.

Amongst the predators, the 7-spot ladybird *Coccinella septempunctata* showed the highest count, especially amongst the abundant aphids in the pea field. The pea crop also showed a relatively high count of the hoverfly *Episyrphus balteatus*, which was not found in the nettle plots within the pea field. Overall, the nettle plots in the pea field showed the same diversity of predators and parasitoids as the surrounding part of the field. In the wheat field, however, there were twice as many predator species in the nettle plots than in the surrounding field. This difference was due especially to the presence of various hoverflies, anthocorid bugs and lacewings. In the rape field, there were only a few predator species and no parasitoids, but the number of predator species was four times greater where the nettles were present amongst the peas.

The authors conclude that the introduction of nettles into the agroecosystem can rapidly provide benefits for biodiversity and for the natural control of pests.

### Reference

Alhmedi, A., Francis, F., Bodson, B and Haubruge, E. (2007). Evaluation de la diversité des pucerons et de leurs ennemis naturels en grande cultures à proximité de parcelles d'orties. *Notes fauniques de Gembloux* **60**, 147-152.



## FUTURE UK EVENTS

### Biodiversity Training Project

This project, now in the final year of a five-year programme, includes a series of training courses, primarily for voluntary recorders and based mainly in the English west midland counties of Shropshire and Staffordshire. Invertebrate courses from July 2010 onwards (but subject to possible change) include the following taxa: dragonflies and damselflies (14th July), shield bugs (8th Sept.) and White-clawed crayfish (30th Sept.). All courses are free of charge but must be booked in advance with the Project Officer. Pete Boardman (Tel: 01743 852100. Fax: 01743 852101. e-mail: [pete@field-studies-council.org](mailto:pete@field-studies-council.org)).

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### NOTICE

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